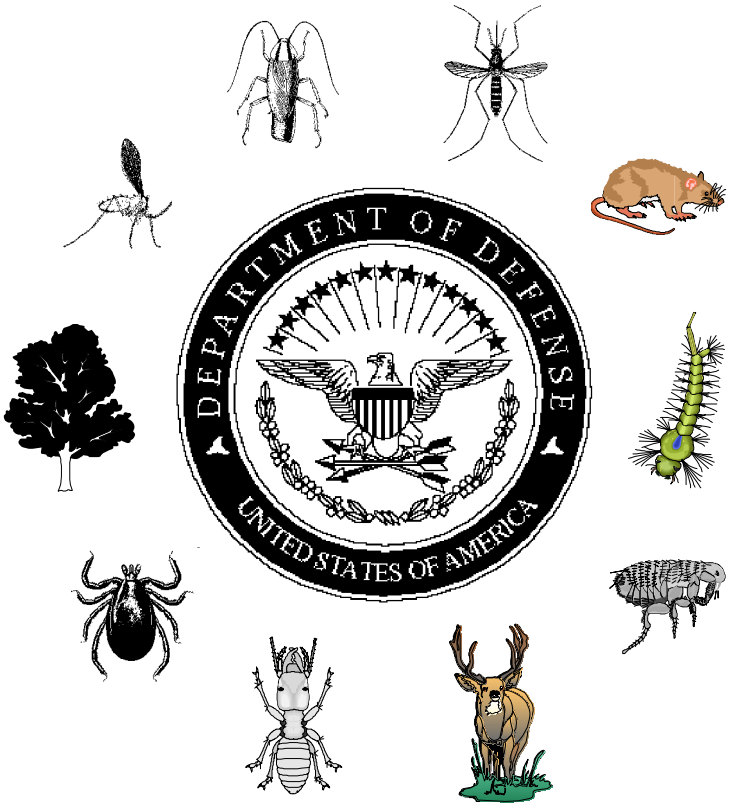
ARMED FORCES PEST MANAGEMENT BOARD

TECHNICAL INFORMATION BULLETIN

DEFENSE PEST MANAGEMENT INFORMATION ANALYSIS CENTER



MAR-APR 1996

DEFENSE PEST MANAGEMENT INFORMATION ANALYSIS CENTER

ARMED FORCES PEST MANAGEMENT BOARD
FOREST GLEN SECTION, WALTER REED ARMY MEDICAL CENTER

WASHINGTON, DC 20307-5001

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TECHNICAL INFORMATION BULLETIN (TIB) RECIPIENTS: The TIB is published by the Defense Pest Management Information Analysis Center to provide current information that may be of interest to the DoD pest management community. Comments, questions, and contributions are welcomed. Please send them to: Chief, DPMIAC/AFPMB, Forest Glen Section, WRAMC, Washington, DC 20307-5001, or call DSN 295-7479, (301) 295-7479; FAX (301) 295-7483. Reference to a commercial product or source in the Bulletin does not constitute DoD or AFPMB endorsement, unless specifically stated as a recommendation for DoD personnel. The Secretary of Defense has determined that publication of this periodical is necessary in the transaction of the public business, as required by law of the Department of Defense.

ANNOUNCEMENTS

AFPMB/DPMIAC Activities

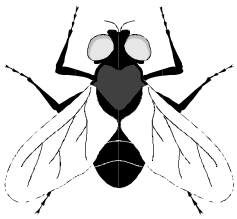
- **DoD Directive 4715.1, "Environmental Security"** - This new directive, signed 24 February 1996 by Deputy Secretary of Defense John P. White, provides a capstone for the DoD Environmental Security and DoD Pest Management Programs. It replaces DoD Directive 5100.50, "Protection and Enhancement of Environmental Quality," 24 May 1973, and establishes policy for environmental security within the DoD. - CAPT Bolton, AFPMB.

- **Pesticide Environmental Stewardship Program (PESP)** - Ms. Goodman and Mr. Fred Hansen, the Deputy Administrator of the EPA, participated in a ceremonial signing of the Memorandum of Understanding (MOU) that officially makes DoD a partner in the PESP. The ceremony took place at the recent meeting of the American Defense Preparedness Association in Orlando. The EPA has developed a press release on the MOU, which they coordinated with the AFPMB and Ms. Goodman's office. To obtain a copy, mark the last page of the TIB and return it to DPMIAC. - Col(Sel) McKenna, AFPMB.

- **TIB Available Via E-mail** - With the increased use of the internet and electronic mail (e-mail) in the DoD, DPMIAC is now offering the TIB via e-mail. To receive the TIB electronically, send your current postal address, phone number, and e-mail address to Capt(Sel) Forcum. His e-mail address is: **forcumch@acq.osd.mil** The TIB is also available on the World Wide Web (see above), the Defense Environmental Network Information Exchange (DENIX), the DPMIAC Command Fax (301) 295-7497, DSN Prefix 295, and as printed hard copies through the U.S. Postal Service. If you are not receiving your TIBs in a timely manner (they are always mailed before the end of the month posted on the TIB cover), please contact DPMIAC. - Capt(Sel) Forcum, AFPMB.

- **After Action Reports (AARs) Requested** - DPMIAC would like to archive available AARs relevant to disease vector/pest surveillance and management in military and public health operations. If you have access to any such AARs, please forward them to DPMIAC. - COL Lawyer, AFPMB.

- **Devices for Electrocuting Flying Insects** - This new Technical Information Memorandum (TIM) is now available from DPMIAC. To obtain a copy, mark the last page of the TIB and return it to DPMIAC. - LCDR Corneil, AFPMB.



- **AFPMB World Wide Web Server** - The AFPMB home page provides a framework for accessing the large amount of information available at the AFPMB and DPMIAC. The server site has been officially registered as: **www-afpmb.acq.osd.mil** Presently available on the server are the latest three modified editions of the Technical Information Bulletin, five Technical Information Memoranda, the Disease Vector Ecology Profiles for Haiti, Somalia, and the former Yugoslavia, and the Proceedings of the last DoD Tri-service Pest Management Workshop. - LCDR Corneil, AFPMB.

U.S. DEPARTMENT OF AGRICULTURE (USDA) ACTIVITIES

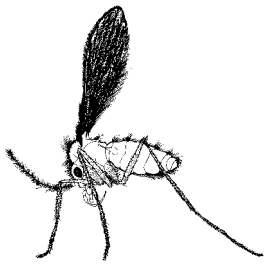
Center for Medical, Agricultural, and Veterinary Entomology (CMAVE) Formed - As part of the U.S. Department of Agriculture's Agricultural Research Service (ARS) reorganization, underway since 1994, the Medical and Veterinary Entomology Research Laboratory (MAVERL) and the Insect Attractants, Behavior, and Basic Biology Research Laboratory (IABBBRL) in Gainesville, Florida, have been merged to form ARS's new entomological research arm, the Center for Medical, Agricultural, and Veterinary Entomology (CMAVE). This realignment was announced on 22 March 1996, and transition to the new organization will be complete by 1 October 1996. The change will place all research units at both laboratories under the direction of Dr. Herbert Oberlander, director of the IABBBRL. Dr. Oberlander is leading on-site transition actions to ensure a smooth metamorphosis from the labs to CMAVE. Leaders at ARS headquarters and the Gainesville labs have assured us that DoD research currently under way at the MAVERL will be completed and researchers will continue to support DoD interests in the future.

Dr. Oberlander described his views on the merger of the MAVERL and IABBBRL as follows:

"Established during World War II to develop technology for the protection of military personnel from insect vectors of disease, the MAVERL has developed a preeminent position as one of the world's leading medical and veterinary entomology laboratories. It was joined in Gainesville in 1969 by the IABBBRL, which

was established to conduct basic research on insect behavior and on the biology of stored product insects. However, in recent years the mission of the attractants laboratory has become more focused on meeting the specific research needs of agricultural entomology. At the same time, a variety of state-of-the-art approaches have been employed at the MAVERL. Thus, I believe the distinction between 'basic' and 'applied' research activities at the two laboratories is not paramount, and the research is primarily defined by the target pests."

"Currently, the missions of the two laboratories read as follows: 'To conduct research on the biology of insects of economic importance. The research program is based on the premise that environmentally safe pest control requires an understanding of the vulnerabilities in the insect life cycle (IABBBRL)'; and 'To develop technology and integrated management strategies for insects and other arthropods of medical and veterinary importance. The mission includes the development of safer and more effective chemical, biological, and genetic control technologies (MAVERL).' Clearly, these missions are complementary. In fact, the IABBBRL has been engaged in a number of pilot tests and other formal applied projects that have utilized pheromones, parasites, electronic detection of hidden infestations, and plant growth regulators for developing integrated pest management strategies. At the same time the experience of MAVERL scientists with insect pathology, repellents, genetics, and semiochemicals, among others, provides significant expertise to the CMAVE's array of approaches to insect pests."



"The creation of a unified ARS Center for entomological research in Gainesville provides an opportunity for increased cooperation, coordination, and efficiency that will result, in the long run, in a stronger research program, and with the maximum amount of local dollars allocated in direct support of research."

"There has been over many years a spirit of cooperation between the two laboratories which provides a base for building unity of purpose and pride in our achievements. While change inevitably brings some uncertainties with it, the merger of the two ARS entomology laboratories in Gainesville into a single center provides an important opportunity for meeting the budgetary and research challenges facing us."

The AFPMB looks forward to a continued strong working relationship with the CMAVE, identical to the one we enjoyed with the MAVERL, and the Insects Affecting Man and Animals Laboratory before that, further extending over 50 years of outstanding mutual support.

Update on USDA Restructuring - USDA's overall agency restructuring is progressing ahead of schedule. Greater than targeted reduction of staff years has been accomplished through normal attrition, including personnel changes and retirements, and the use of special personnel authorities such as early outs and buyouts. Nearly four of every 10 supervisory positions are to be eliminated. The number of agencies will be reduced from 43 to 29, administrative operations will be consolidated, and field locations will be closed or moved to create one-stop "service centers." Consolidation of the original 3,700 locations into service centers has already resulted in moving or closing offices at 397 locations. Offices in nearly 700 more locations will be moved or closed by the end of 1997, resulting in 2,536 service centers across the country.

Additional reforms and reorganization within the Department are under way in the following areas:

(1) Consolidation of administrative functions to eliminate unnecessary duplication by having only one staff provide administrative services for each program mission area has been completed in six of the seven areas. Plans for administrative consolidation within the seventh area are still under study as part of discussions with Congress on reorganization of the Forest Service.

(2) "Reengineering" financial, personnel, procurement, and other administrative processes as part of a comprehensive effort to reform management support services and assist agencies in providing needed services to manage operations with fewer people.

(3) Reducing acquisition, budget specialists and auditors, and personnel by 18-22%, eliminating organizational layers and supervisors by 37%, increasing the employee:supervisor ratio from 8:1 to 11:1. A 14% reduction in high grade positions is also included.

(4) Improving the way the Department handles civil rights discrimination complaints. The counseling/mediation function has been consolidated to create a centralized, professional staff to handle employment discrimination complaints in a more timely and efficient manner.

(5) Improving customer service through a variety of methods to respond to customer service issues such as forming internal teams or councils, installing toll-free numbers for customers, holding customer feedback meetings, and developing customer service training for employees. Restructuring is projected to cut through the layers of red tape, with the focus on providing better customer service in the field and keeping USDA employees on the front lines, where they can provide information, answer questions, and better serve the American people. ---

- USDA News, 55(1) JAN 96.

USDA's National Research Initiative Competitive Grants Program - Dr. Harold Harlan, LTC, MSC, USA (Ret.), is currently serving as Acting Program Director, Entomology & Nematology Programs, USDA/CSREES/National Research Initiative Competitive Grants Program at USDA national headquarters. From him we have received information on research grants available through USDA. Applications are solicited annually for competitive grant awards in agriculture, forestry, and related environmental sciences under the National Research Initiative Competitive Grants Program (NRICGP) administered by the Office of Grants and Program Systems, Cooperative State Research, Education, and Extension Service (CSREES). Research areas of particular interest to TIB readers are under the category "Pest Biology, Biological Control, and Integrated Pest Management." The broad goal of this category is to support fundamental and mission-linked research on the biology of pest species, the biotic agents that suppress pests, and the interactions between plants and their pests. In addition, this area supports mission-linked research in the areas of biological control and pest management strategy assessment, which are expected to broaden the knowledge base for near-term adoption of safer alternative pest management strategies, such as alternatives to methyl bromide, that are environmentally benign and reduce human health risks. Applicants are encouraged to contact one of the program directors at Tel: (202) 401-5114 or 401-6466 or e-mail to **srockey@reeusdagov** or **apark@reeusdagov** for information on the suitability of the proposed research to one of these programs. Brief descriptions of four of these areas follow.

51.2 **Entomology** (including other arthropods): Studies on arthropod pests that infest stored and transported agricultural products are also appropriate. Studies in the following areas of insect biology are encouraged: (a) behavioral physiology, (b) chemical ecology, (c) endocrinology, (d) population dynamics, (e) genetics, (f) behavioral ecology, (g) pathology, (h) predator/parasite insect relationships, and (i) toxicology, including fundamental pesticide resistance studies.

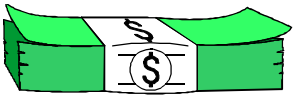
51.4 **Weed Science**: This program area will include studies on the biology and ecology of forest, rangeland, or crop/weed interactions with the ultimate goal of improving the integration and sustainability of weed management practices.

51.5 **Biological Control Research**: The focus is on discovery, development and implementation of successful biological control strategies with near-term applicability. Fundamental studies may be proposed in areas where critical basic knowledge will serve to advance biological control applicability or implementation. The systems under study can include pests occurring in urban landscapes, and food transported and stored for human consumption, among others.

51.6 **Assessing Pest Control Strategies**: Mission-linked research support for the assessment of conventional and alternative pest control strategies, including determination, comparison and benefits analysis of biological, economic, social, or environmental impacts, and resistance management studies. Proposals that include a modeling component must give consideration to validation of the model. Multidisciplinary approaches are encouraged. Research on the development of application technology is not appropriate to this section. However, studies that propose to assess application technologies as part of a larger pest control management system may be appropriate.

There are other categories of potential interest to some TIB customers. For a comprehensive program description and an application kit, contact the National Research Initiative Competitive Grants Program, CSREES, USDA, Room 323 Aerospace Center, AG Box 2241, Washington, DC 20250-2241, Tel: (202) 401-5022, E-mail: **nricgp@reeusda.gov** ---- Harold J. Harlan, Ph.D., Acting Program Director, Entomology & Nematology Programs, USDA/CSREES/NRICGP, Tel: (202) 401-5114, Fax: (202) 401-6488, E-mail: **hharlan@reeusda.gov**

Update on ARS FY 97 Research Budget - ARS research received an impressive boost in the President's proposed fiscal year 1997 (FY 97) budget:



an overall net increase of $66.3 million for research and construction projects. An increase of $29.8 million was proposed for several critical research programs in ARS, coupled with redirection of lesser priority research projects and an across-the-board reduction in funds for research totaling $20 million. No location closures are proposed, unlike in the previous two years.

The President stated in late March that he would sign the farm bill agreed upon by Congress, but indications are that he will seek some changes next year. That legislation contains a reauthorization of research programs for two years, giving Congress and the Administration time to agree upon future changes. It will also channel additional funds for rural development and agricultural research programs through the Fund for Rural America, including a $33 million increase for

competitive grants via the National Research Initiative (see previous TIB for information about the USDA's National Research Initiative Competitive Grants Program).

The House Subcommittee on Resource Conservation, Research, and Forestry of the House Committee on Agriculture convened on 27 March 1996, for the first of three scheduled hearings concerning the research title of the farm bill. The focus of the hearing was research priorities, with interest in agricultural research priority setting. Predictably, questions for ARS focused on those issues getting the most media attention in recent weeks, including "Mad Cow Disease" [bovine spongiform encephalopathy (BSE) in Britain], Russian poultry, and Karnal bunt (a disease of wheat).

The $66.3 million increase in funding for ARS research and construction projects is especially significant considering that it comes at a time when many other government agencies are facing reductions. It reflects a high level of confidence in the research carried out by the ARS. ---- ARS News Notes, 29 MAR 96.

INTEGRATED PEST MANAGEMENT

New Biological Control Agent for Golf Course Pests - Golf courses, which receive a significant proportion of pesticides applied on military installations, are taking center stage in the push for effective biological controls against insect pests to reduce the necessity for application of chemicals. ARS entomologist Michael G. Klein has identified a tiny nematode, *Steinernema glaseri,* as the foot soldier in the ongoing battle against destructive larvae of the Japanese beetle. *S. glaseri,* which is native to New Jersey and is superior to other strains at killing grubs, was investigated by ARS scientists in collaboration with university researchers. The nematode is so host-specific that it won't attack turf. Nematodes are an economical alternative to costly chemicals because they can be raised in large quantities and applied with regular pesticide sprayers. *Steinernema glaseri* tracks white grubs by following the insects' carbon dioxide trails, released through their spiracles. Parasitic nematodes normally enter their host's spiracles, but Japanese beetle larvae have protective plates over their breathing vents, so *S. glaseri* enter through the mouthparts. Once inside the grub the nematodes release the bacterium *Xenorhabdus poinarii* into the grub's bloodstream. This kills the grub within 24 hours and liquefies its tissues. The nematode then uses the grub's body to produce more grub-killing nematodes and bacteria. The next generation of *S. glaseri* emerges about two weeks later to begin its quest for prey.

In field trials, *S. glaseri* killed up to 50 percent of white grubs in a 10-square-foot plot. Success depends on releasing nematodes at a level that simply overwhelms the defense mechanisms of the grub. Scientists are currently perfecting the delivery system for *S. glaseri.* ---- Agricultural Research, FEB 96, pp. 12-13.

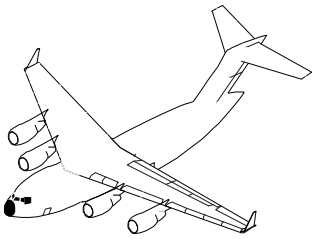
Mosquito Biocontrol - A parasitic nematode from Argentina is one of the latest candidates for mosquito biocontrol. Scientists imported the nematode in 1994 and have developed methods to raise it in the laboratory. In lab tests, nematodes infect and kill larvae of *Anopheles*, *Culex*, and *Aedes* mosquitoes. *Anopheles* mosquitoes can transmit malaria and *Aedes* mosquitoes can transmit dengue, yellow fever and other diseases, while *Culex* and *Aedes* salt marsh mosquitoes are major nuisance pests. The nematodes infect mosquito larvae, develop within the larvae, penetrate its cuticle, and emerge, causing the death of the pest. Researchers say the nematodes also appear to tolerate salt water--a key advantage, since some of the targeted mosquitoes breed in brackish water in coastal areas. Contact: James J. Becnel, USDA, ARS, MAVERL, Tel: (352) 374-5961.

More Mosquito Biocontrol - In a three-year study in north central Florida, researchers looked for natural enemies of mosquitoes that breed in bird baths, clogged gutters, old tires and other containers that collect water. Among these container-breeding species is the Asian tiger mosquito, *Aedes albopictus*, an aggressive biter that can transmit dengue and other diseases. Researchers found seven microorganisms, including four protozoans, two fungi, and a bacterium, that infect *A. albopictus*. All but one of the natural enemies appear to be indigenous to Florida, and some could provide natural controls for *A. albopictus*. Contact: Tokuo Fukuda or Donald R. Barnard, USDA, ARS, MAVERL, Tel: (352) 374-5938/5930.

German Cockroach Pheromone - A chemical scent that German cockroaches release in their feces also lures them to trap baits and may help in controlling these household pests. Scientists say the roaches produce the chemical, called an aggregation pheromone, in rectal glands and that it is passed with the feces. The researchers found that adding the pheromone to the area around the bait increased by more than 50 percent the number of roaches entering traps. This was the first study testing this pheromone as a cockroach lure, and scientists say it has potential for boosting the effectiveness of roach traps. Contact: Richard Brenner,

USDA, ARS, MAVERL, Tel: (352) 374-5903.

PESTICIDES & EQUIPMENT



Rapid Pesticide Acquisition - Are you deploying to some vector-borne disease hot spot and/or need your pesticides and repellents "a week ago Tuesday"? The Defense Supply Center Richmond (DSCR) and the Emergency Supply Operations Center (ESOC) at Richmond, VA are on call 24 hours a day, seven days a week, to provide emergency supply needs. The following telephone numbers apply:

- 24 hr Customer Service Center, Tel: (804) 279-4865, DSN Prefix 695, Fax: (804) 279-6730/5277
- Chief, ESOC (Maj Richard K. Boch, USMC), Tel: (804) 279-5460, DSN Prefix 695
- Defense Logistics Agency (DLA), ESOC Washington, DC, Tel: (703) 767-3700/2700, DSN Prefix 427

Mr. Clifford Myers is the DSCR point of contact for pesticides, repellents, chemicals, hazardous materials, and environmentally preferred chemical products. Contact Mr. Myers at DSCR for logistical, technical, or procurement concerns regarding pesticides or other chemicals. He can be reached at: Defense Supply Center Richmond, Product Center Team # 4, ATTN: JDTB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5810, Tel: (804) 279-3995, DSN Prefix 695, Fax: (804) 279-6347/6008/4403, Pager: 1-800-759-7243 and enter PIN: 8953419# (continental U.S.) ---- Clifford Myers, DSCR.

Ordering Pesticides Via Paperless Order Procurement System (POPS) - POPS is an electronic interface between the Defense Supply Center Richmond (DSCR) and commercial industry that enables DSCR to fill customer requisitions for pesticides (i.e., repellents, insecticides, herbicides, rodenticides, disinfectants, etc.) quickly and efficiently from vendor-maintained inventories. This contrasts with the traditional logistic system that requires large periodic procurements of inventories for storage at depots and subsequent filling of customer requisitions from these stocks. Under POPS, the vendor assumes the responsibility and expense of inventory maintenance, storage, shipping and handling-functions already performed by the commercial pipeline. Savings from reduced inventory investment, second destination transportation costs and handling by depots are passed on to you, the customer, in the form of reduced standard unit prices and reduced surcharges.

Shipments are in standard commercial packs and bear standard commercial markings with the exception that the exterior container or box bears the requisition number, the National Stock Number (NSN), contract and order number, an in-the-clear ship-to address, and a mark-for Acquisition Advice Code (DoDAAC), when applicable. Overseas shipments may bear additional markings. NSN unit prices are obtainable either from the AFPMB Standard Pesticide Listing or the Defense Logistics Services Center (DLSC) NSN Total Item Records (TIRs). If you have technical or logistical questions, you can contact the following individuals:

- Technical: Mr. Clifford Myers, Tel: (804) 279-3995; DSN Prefix 695, Pager 1-800-759-7243, PIN 8953419# (continental US), Fax: (804) 279-6347/6008/4403
- Supply: Mrs. Joyce Harold, Tel: (804) 279-3943; DSN Prefix 695, Fax: (804) 279-6347/6008/4403

DoD and Federal Civil Agency activities can and should requisition pesticides by submitting requisitions to "S9G" (DSCR) using MILISTRIP/FEDSTRIP procedures in lieu of local contracting/purchasing. You will find this system to be cost effective with quick delivery. DSCR will not rest until you, the customer, are completely satisfied. ---- Clifford Myers, DSCR/DLA.

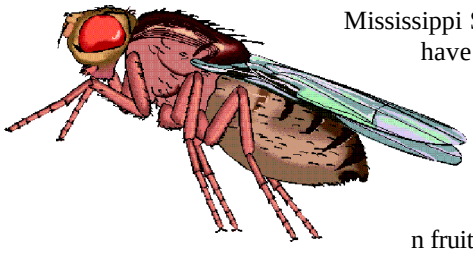
Inerts: Not Always "Inert" - On a pesticide label, "inert" refers to those ingredients that have no pesticidal activity -- they are used to dissolve, emulsify, or stabilize the active ingredient, serve as wetters, or penetrants, or have other functions to help the pesticide work better. So they are not always truly inert. Pesticide manufacturers usually do not list on the label what the inert ingredients are, though labels do identify such compounds as petroleum distillates. Even the Material Safety Data Sheet (MSDS) for a particular pesticide may reveal only some of the information, not all of the inert ingredients in a product.

Some inerts are actually toxic. A recent study published by the American Chemical Society indicated that many general health complaints from people exposed to indoor insecticides are due to volatile organic compounds (VOCs), used as inert ingredients, and not to the insecticide itself. VOCs from a spray application may linger from several hours to most of the day in an unventilated room. The inert ingredients in your pesticides may include water, which is obviously not considered toxic; benzene, which is considered toxic; and clay, which is used as an emulsifier in wettable powders. In 1991 the EPA released a list of 1820 different chemicals used as inerts. For 80 percent of these chemicals there, is no toxicology information. The EPA has identified about 50 inert ingredients as being of significant toxicological concern.

Since 1986 the EPA has been working to reduce the potential for adverse effects from the use of pesticides containing toxic inert ingredients. One step has been to encourage the use of inert ingredients of low toxicity in place of ingredients of high toxicity whenever possible. In addition, inert ingredients for which toxicity is not known will be studied to determine if they are safe. New inert ingredients of toxicological concern will be registered unless the product is clearly similar to existing products.

Because applicators may not know whether the inert ingredients in a pesticide are toxic, what can they do to protect themselves? As always, treat every pesticide as potentially dangerous; use good judgement in all applications; read the pesticide label; and follow the caution warnings, user safety recommendations, and directions on the pesticide label. And if you are exposed, follow the first aid recommendations on the label and call your local poison control center. While you may not know exactly what you are handling, you should know exactly how to handle it. ---- ACCES--Pesticides, The University of Arizona, Pesticide Coordinator's Office, 21(1): 1, JAN 96.

***Science* Spotlights New Pesticide** - Researchers from the USDA and a biochemist at Mississippi State University have found a potential alternative to malathion for control of Mediterranean fruit flies (medflies) that threaten billions of dollars of California crops and have led to a storm of protest over wide area applications of malathion for medfly control. Field tests of two dyes that become toxic in the digestive tract of insects, but not mammals, showed that they are highly effective against the medfly and the Mexican fruit fly (mexfly). The dye concentrations in the preliminary tests were much smaller than the malathion concentrations currently used in bait sprays.



The two dyes, phloxine B and uranine, have been used for decades to color drugs and cosmetics and have been deemed safe by the FDA. The dyes' selectivity stems from the fact that they become toxic only after exposure to light. Insects have translucent bodies and digestive tracts that are easily penetrated by sunlight. As a result, when medflies eat a protein-based bait laced with the dyes, the compounds can be activated in the flies' digestive systems. But in humans, other mammals, fish, or birds, the dyes pass through the digestive system without being exposed to light. The dyes' absorption of energy from photons starts a deadly chain of reactions in the insect. Excess energy from photons is nabbed by nearby energy-hungry oxygen atoms. The energy excites and destabilizes one electron orbiting the oxygen, transforming the atom into singlet oxygen which more easily binds to surrounding molecules. In insect tissues, singlet oxygen typically binds with lipids in cell membranes and amino acids in proteins, changing their structure and, thus, interrupting their functions. This process, once started, has a cascading effect, killing cells and eventually the organism itself. In cosmetics or on leaf surfaces, this chain of events is broken, apparently because singlet oxygen doesn't have a chance to penetrate cells before it reacts with other compounds. The two dyes together have a synergistic effect.

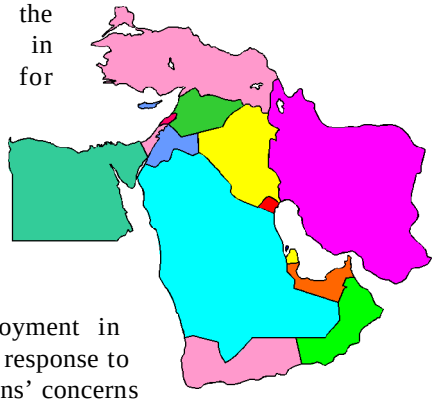
At a meeting in April 1995, two groups of researchers from the USDA reported that the dyes appeared to be very effective in small-scale field trials. In one trial with caged mexflies in grapefruit trees, nearly 90% of the flies were killed within four days. In the first uncaged field trial, on a 10-acre plot of coffee bushes, the fruit fly population dropped 50% compared with an unsprayed plot, even though the sprayed plot was surrounded by 1,000 acres of untreated plantation, allowing flies from untreated areas to migrate into the test site. ---- Science, 12 MAY 95, p. 806.

AFPMB Note: The EPA recently approved an experimental use permit for large-scale field tests of a formulation of light-activated dye for medfly control on oranges in California, coffee in Hawaii, and grapefruit in Texas. For more information, contact Rebecca Cool, EPA, Tel: (703) 305-5200 [**Source**: *IPM Monitor*, Fall 95, p. 4]. The favorable characteristics of this class of compounds (low mammalian toxicity, broad-spectrum effectiveness, low volatility, and relatively innocuous breakdown products) make them inviting candidates for application to other pest species.

Bti - There's an easier, less expensive way to control black flies. Working in New York State's Adirondack Mountain streams, scientists have found that measuring the width of the streams is an accurate way to decide how much *Bacillus thuringiensis israelensis* (Bti) to add to the water to kill fly larvae. Previously, fly abatement program operators had to measure the volume of water flowing through the stream--a labor-intensive and costly process. In 315 Adirondack streams researchers determined that, measuring stream width was as accurate as measuring water volume. Bti, an environmentally friendly insecticide, is crucial for controlling biting flies. Contact: Albert H. Undeen, USDA, ARS, MAVERL, Tel: (352) 374-5966.

MEDICAL ENTOMOLOGY

Comprehensive Clinical Evaluation Program for Persian Gulf War Veterans - Approximately 697,000 U.S. service members deployed to the Persian Gulf in 1990/1991 for Operations Desert Shield/Storm (ODS/S). The vast majority of troops returned from this large deployment in good health. In response to Gulf War veterans' concerns about the potential health effects of service in ODS/S, the Departments of Defense (DoD) and Veterans Affairs (VA) developed similar, comprehensive clinical evaluation programs to provide care and to understand the nature of reported illnesses. The DoD Comprehensive Clinical Evaluation Program (CCEP) provides a systematic, in-depth medical evaluation for DoD beneficiaries (Persian Gulf War veterans now on active duty or retired, members of the full-time National Guard who are Persian Gulf veterans, Persian Gulf War veterans who are members of the Ready Reserve/Individual Ready Reserve/Standby Reserve placed on orders by their units, and eligible family members of such personnel) who are experiencing illnesses that may be related to their service in the Persian Gulf. As of early December 1995, more than 27,000 individuals had enrolled in the program. Approximately 21,000 of these participants requested an examination; 18,598 completed the evaluation process and had their health records verified and entered into the CCEP database.



This report summarizes diagnostic results of more than 18,000 systematic clinical evaluations completed through the CCEP. The CCEP was designed primarily as a clinical rather than a research program. Self-selection of patients, recall bias, inability to validate self-reported exposures, and the lack of an appropriate comparison or control group limit the ability to generalize about the relevance of CCEP findings to other Persian Gulf veterans. However, the large size of the CCEP cohort and the thoroughness of the CCEP examinations may help us understand the nature of these veterans' illnesses and health concerns. Ongoing and planned epidemiologic studies by the DoD, VA, and Health and Human Services that involve control/comparison populations should further characterize the health consequences of the Persian Gulf War.

Based on the evaluation of 18,598 participants, our findings indicate that:

➡ CCEP participants report a wide variety of symptoms spanning multiple organ systems in no consistent, clinically apparent pattern. In the clinical literature, only a limited number of studies of symptoms of patients in other surveys have been published. These other study populations are not completely analogous to the CCEP population, since they generally involve older patients and more women than found in the CCEP. However, these studies of outpatient practice and the general U.S. population suggest that the types of symptoms being reported in the CCEP are not unique and are similar in nature to those seen in other groups.

➡ Symptoms such as fatigue, joint pain, headache, or sleep disturbances are common among CCEP participants. Published studies involving patients with these generalized symptoms have shown that in 20-75% of cases there is no clear-cut physical explanation or "cause," even after a thorough medical evaluation. Similarly, it is likely that in some CCEP participants it may not be possible to provide a generalized symptoms.

➡ The distribution of primary diagnoses seen in CCEP participants spans many different organ systems, as categorized according to the International Classification of Diseases-Ninth Revision, Clinical Modification (ICD-9-CM). However, over half (65%) of the primary diagnoses of CCEP participants are concentrated in four diagnostic groups: "Psychological Conditions," "Symptoms, Signs, and Ill-Defined Conditions," "Musculoskeletal and Connective Tissue Diseases" and "Healthy."

➡ Gulf War veterans who have participated in the CCEP are experiencing real symptoms and illnesses with real consequences, although the vast majority of participants are apparently able to function in their jobs. Severe disability, measured in terms of reported lost workdays, is not a major characteristic of CCEP participants. Relatively few CCEP participants report missing work, and most had not missed work because of illness or injury during the 90 days prior to their initial evaluation. Determination of the extent to which the CCEP disability experience reflects the overall disability experience of Persian Gulf veterans is limited by the fact that many Persian Gulf War veterans are no longer on active duty.

➡ Comparisons of CCEP participants with patients in outpatient medical settings are limited because of differences in patient populations. However, some existing clinical studies provide a context in which to consider the following CCEP findings:

- The most common psychological conditions found

in CCEP participants are: tension headache; nonspecific, mild, or stress-related anxiety and/or depression; and posttraumatic stress disorder. The prevalence of psychological diagnoses among CCEP participants may be higher than that observed in other patients seen in general medical practice.

- CCEP diagnoses include a group of common medical conditions not classified elsewhere in the ICD-9-CM coding system (e.g., sleep apnea), generalized symptoms, abnormal laboratory tests, and nonspecific physical findings. These diagnoses, which are categorized as "Symptoms, Signs, and Ill-Defined Conditions" according to the ICD-9-CM coding system, may occur more frequently in the CCEP than they do among patients seen in general medical practice.

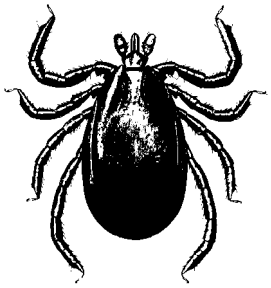
- Musculoskeletal and connective tissue diseases (joint pain, osteoarthritis, backache) are common diagnoses seen in CCEP participants. These conditions appear to occur more frequently in the CCEP population than they do in patients seen in general medical practice.

➡ The evaluation of reproductive risks to men and women from environmental exposures is a complex and emotional issue. Some CCEP participants self-report experiencing adverse reproductive events since the Gulf War. However, these reports have not been validated. Reproductive studies of other groups of Persian Gulf veterans, which have involved review of medical databases and records and related databases, have to date found no evidence of increased reproductive problems. Clearly this is an important issue, which the Department will study further.

➡ To date, there is no clinical evidence for a previously unknown, serious illness or "syndrome" among Persian Gulf veterans participating in the CCEP. A unique illness or syndrome among Persian Gulf veterans, capable of causing serious impairment in a high proportion of veterans at risk, would probably be detectable in a population of 18,598 patients. However, an unknown illness or syndrome that was mild or affected only a small proportion of veterans at risk might not be detectable in a case series, no matter how large.

DoD will continue to provide comprehensive high quality health care to eligible Persian Gulf veterans and their family members and will continue its efforts to understand any health consequences of service in the Persian Gulf War. The Department is committed to a continuing exchange of relevant information with other government agencies, researchers, and Gulf War veterans to further understand this important public health issue. ---- Gulflink, Persian Gulf War Illnesses Home Page:

http://www.dtic.dla.mil/gulflink/

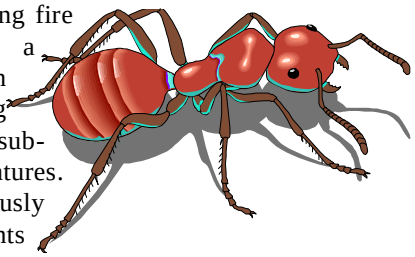


Earliest Known Lyme Disease Vectors Found in Europe - In the 18 November 95 issue of *Lancet*, a research team at the University of Berlin's Humboldt Medical Faculty reported finding the bacterium *Borrelia garinii* in 19th-century ticks, making these arthropods the bacterium's earliest known hosts. Early accounts of ring-shaped rashes and other symptoms of Lyme disease have been found in Germany, but these case reports, dating as far back as 1882, do not identify the agent responsible. This leaves open the questions of: (1) whether the *Borrelia* spp. bacteria that cause Lyme disease existed back then and: (2) whether they were carried by the same host that carries them today, the sheep or castor bean tick, *Ixodes ricinus*, a close relative of the known vectors in North America, *I. scapularis* and *I. pacificus*.

Twenty-one *I. ricinus* ticks preserved in alcohol since the late 1800s were provided by the Vienna Natural History Museum in Austria for the study. The research team extracted each tick's midgut, the part of the host where *Borrelia* bacteria live today, and used polymerase chain reaction (PCR) to amplify the DNA found there. The genetic material in two midguts matched that of *B. garinii*, one of three species of *Borrelia* that can induce Lyme disease, and a species which has been identified as a cause of the disease in Europe. These host ticks had come from a Hungarian cat in 1884 and from a fox caught in Austria in 1888. The team's leader would like to hunt for even earlier infestations, but he suspects that obtaining older ticks to chop up for the process will prove difficult, noting that "curators were reluctant to hand over [specimens] they had stored for more than 100 years," making it unlikely that even older and rarer specimens would be made available. ---- Science News, 148: 373, 2 DEC 95.

Tsetse Fly - Chemicals found on the waxy surface of tsetse flies could help scientists better understand the mating behavior of these pests, which in Africa spread a debilitating disease called sleeping sickness. Scientists isolated previously unreported chemical compounds from males and females of eight tsetse fly species. The compounds are sex stimulants, and upon contact, help males zero in on females of the correct species. In looking for a mate, the male grabs hold of a female fly. Then the male uses chemically sensitive hairs on his middle legs to tell if the female is the right species for mating. The newly discovered compounds, similar to those found on closely related fly species, could help researchers develop more effective traps and other biological control strategies for the tsetse fly.

Contact: David A. Carlson, USDA, ARS, MAVERL, Tel: (352) 374-5940.



Fire Ants - Stinging fire ants have gained a foothold in Tennessee, proving they can survive sub-freezing temperatures. Scientists previously believed the ants could only overwinter in climates similar to their native South America. They are now established on 275 million acres in 11 southern states and Puerto Rico. But in 1992, USDA researchers discovered an isolated, 3,000-acre infestation about 45 miles northeast of Chattanooga. The ants were thought to have been accidentally brought to the state in wood from a pulp processing factory. In preliminary studies over the last few years, scientists found that 8% of the Tennessee colony survived the record-breaking cold temperatures of early 1994. One possible explanation: two species have formed a hybrid ant that may be able to withstand northern winters. Once studies are complete, scientists hope to be able to predict the ultimate northern range of the fire ant, known for its aggressive behavior and painful stings. Contact: David F. Williams, USDA, ARS, MAVERL, Tel: (352) 374-5982.

NATURAL RESOURCES

Federal Scientists Guard Against Foreign Onslaught - An article in the December 1995 *Government Executive* leads off with the question: "Killer bees, fire ants, creeping vines and mischievous mollusks are among foreign invaders occupying America's lands and waterways. Can the government's hardy corps of weed and pest experts protect us from the onslaught?" The article gives a good, if somewhat sensationalistic, overview of the national situation with regard to introduced noxious pests.

The article addresses the "relentless attack by exotic, invasive species -- species that travel from faraway habitats, colonize virgin territory and then, with no predators to keep them in check, reproduce like crazy." Invading species include insects, plants, or sea creatures, and wild animals descended from escaped livestock -- pests that are slowly choking flora and fauna that have thrived in North America for millennia.

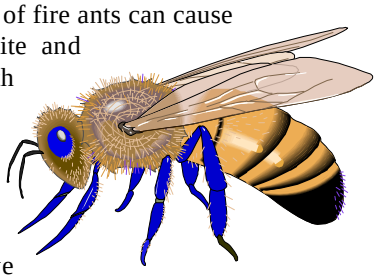
Acknowledging that as little as 15 percent of all exotic species are considered harmful, and that most American food crops were introduced from abroad, the article mentions kudzu, wisteria, purple loosestrife, garlic mustard, *Melaleuca*, and "mile-a-minute weed" among the undesirable invaders. Insect pests include the Mediterranean fruit fly, gypsy moth, Africanized honey bee, and fire ant. The zebra mussel is also mentioned.

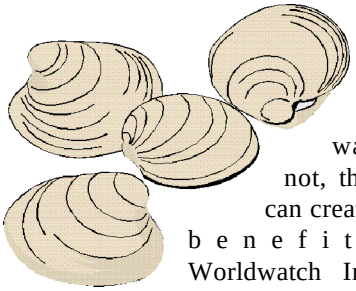
The article addresses noxious species' effects on Federal efforts to manage millions of acres of public land. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service, Plant Protection and Quarantine unit (APHIS-PPQ), the Army Corps of Engineers, the Interior Department's National Park Service, Fish and Wildlife Service, and Bureau of Land Management, and the Agriculture Department's U.S. Forest Service are all mentioned. The article notes that these agencies undertake as many preventive efforts, public-awareness campaigns, and scientific experiments as their "meager" weed and pest budgets will allow.

This paper points out that removal of many noxious plant species is a slow process, often entailing intensive hand labor. Controlled burning, bulldozing, deep-soil removal, chemical spraying -- all are potential weapons in a land manager's arsenal. A species' natural predators can also be imported or introduced. This approach, though risky because its consequences cannot always be anticipated, has been used by the Army Corps of Engineers with little expense and without major side effects for 36 years, according to Dr. Alfred Cofrancesco, Corps entomologist at the Waterways Experiment Station in Vicksburg, Mississippi. For example, about 99 percent of alligator weed, a waterway-clogging plant, has been eliminated by introduced predators since the early 1960s.

The article gives a fair estimate of costs incurred from noxious pests. It notes that however the job is handled, labor-intensive control programs eat up the bulk of most weed and pest budgets. In fiscal year 1995, Fish and Wildlife allocated $56,000 for weed prevention, $30,000 for public education, $121,000 for weed surveillance -- and $2.9 million for integrated pest management (which the author calls "a fancy term for eradication"). A 1993 Office of Technology Assessment (OTA) report found that 79 nonindigenous species had caused a total of $97 billion worth of damage from 1906-1991. OTA further estimated that a mere 15 other species now on the loose could cause an additional $134 billion in damage, all paid for by taxpayers.

The article points out that not all harm caused by introduced noxious species is economic; sometimes, invasive species directly threaten human health, both physical and mental. *Melaleuca* emits substances that can irritate the lungs and skin. Africanized honey bees (so-called killer bees) sting more aggressively than native bees, while hordes of fire ants can cause serious injury if they bite and sting *en masse*; both species are moving steadily northward through the United States. Also, if an invasive species flourishes, many native competitor species inevitably die out. In some





instances, the newly dominant species may provide benefits: the Asian clam helps clean up river water. But more often than not, the reduction in biodiversity can create hazards that outstrip such benefits. The Worldwatch Institute estimates that 30 percent of species on U.S. "endangered" and "threatened" lists are there in part because of changes wrought by invasive species. Biologists also worry that even the humblest plant, if not crowded out, could one day be found to possess an important medical compound. And as invasions reduce the diversity of native ecosystems, either by outright competition or by interbreeding, each ecosystem is left more susceptible to the kind of damage that fitter ones might have survived, such as climate change or blight.

Also mentioned is the often overlooked problem of visual blight. While kudzu is not inherently offensive -- after all, it does prevent soil from eroding, and it extracts excess carbon dioxide from the air -- its blanket uniformity strikes most viewers as unpleasant. Any gardener familiar with crabgrass or kudzu knows that weeds and pests have an uncanny ability to be "ugly."

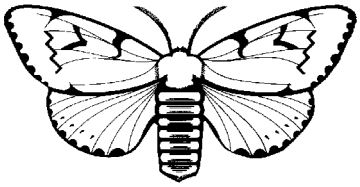
The task of fighting weeds and pests is getting harder. Alien populations multiply exponentially, and the American landscape is undergoing "a giant, uncontrolled experiment." This paper explores monocultural vulnerability and the effects of greater linking of disparate parts of the world by transportation. Worldwatch notes that in Hawaii an average of 18 new insects or other arthropods have established themselves in each of the past 50 years -- more than a million times the islands' natural rate of invasion.

Invasions dramatically increased with the advent of modern transportation. Airplanes permit tiny hitchhiker species to cross oceans quickly. And the growth of automobile tourism in America has enabled vacationers to unwittingly spread seeds from coast to coast. Indeed, the spread of certain species often follows interstate highways. The expansion of world trade has provided pest species with shielded cargo containers and ships that dump ballast water from one port into another halfway around the globe. Even events as seemingly unrelated as military downsizing in Europe can pose ecological headaches. The author notes that by the end of 1995, 150,000 troops, 190,000 family members, 55,000 automobiles, 45,000 pets, 600,000 tons of personal property and untold amounts of equipment will be sent home from Europe -- each providing a pathway into the United States for such species as the gypsy moth. Scientists even report that small sea creatures have begun to trail ships through far-flung ocean currents in order to feed on species residing in dumped ballast. Advanced countries like the United States are no safer from such threats than are their poorer neighbors.

Some specialists detect signs that top officials are starting to pay more attention to the problems caused by alien invaders. Interior Department employees praise Secretary Bruce Babbitt's deputy chief of staff, B. J. Thornberry, as one of the department's first high-ranking officials to put serious time into pests and weeds.

Cooperation among scattered parts of the government is also improving. There's now a Federal Interagency Committee for the Management of Noxious and Exotic Weeds to help share information among the various federal agencies that must deal with nonindigenous species; there's also a parallel committee for aquatic pests. And in September, a first-ever federal, state and private "Weed Summit" was held in Denver.

There have been some high-profile successes. For instance, U.S. and Canadian agencies spent almost $20 million in 1992 to eradicate all vestiges of an Asian gypsy moth outbreak after some moths accidentally slipped into the Pacific Northwest aboard a Russian wheat transport ship. Since then, the Forest Service has worked to train Russian shippers and institute more rigorous inspections there, says Melvyn J. Weiss, assistant director of the Forest Service's pest management unit. Another feared moth infestation -- from a German munitions ship docked at a secure Navy base in Wilmington, NC -- was stopped thanks to multi-agency cooperation.



Perhaps the program's highest-profile job has been to prevent the brown tree snake, which has extirpated half of Guam's bird species, from doing the same in Hawaii. It's no easy task, since the snakes have been known to slither into the wheel bays of a waiting airplane in Guam and then plop onto the tarmac during touchdown in Honolulu. So severe is the snake situation that it is now seen as a national security problem. The Defense Department pays much of the $1.25 million a year it takes for APHIS officers to keep brown tree snakes out of Guam's airport. To do the job, APHIS has eight Jack Russell terriers sniff out the snakes' habitat around the airport. When the dogs find a snake, they bite it to death.

But, problems remain. OTA's 1993 report set out dozens of options for policymakers, tightening existing laws and beefing up enforcement; none have yet been acted upon. And some specialists complain about a lack of awareness of the importance of weed and pest control on the part of both officials and the public. For instance, according to park rangers with the National Park Service, where the mission has always leaned at least as much toward public enjoyment as it has toward environmental protection, broken bridges and untidy

campsites have tended to attract far faster responses from higher-ups than have massive invasions by exotic species. "In the culture of the Park Service, we're out there fighting fires," one ranger says. "We're not well equipped to take on creepy things. As long as everything is green, people don't realize there is a problem." There are even anecdotal tales of resistance among some Westerners to any form of government activity on their lands, even if it's intended to prevent their property from "rotting away."

Though the movement in government today has generally been toward devolving power to the states, Cofrancesco of the Army Corps of Engineers suggests that the federal role is crucial, since insects and plants don't recognize state borders. Also, decisions made by Park Service officials decades ago or even today, ranging from the placement of roads, campsites, and trails to the use of nonnative soils for landfill, continue to complicate the job.

Weed and pest managers, many of whom consider themselves environmentalists, also say they would appreciate research on environmentally friendly alternatives to chemical and biological solutions. Though pesticides often are their most effective tools, these managers worry about environmental side effects and unintended consequences. The $200 million spent on chemical efforts during the 1950s and 1960s to eradicate the fire ant failed because the pesticides were better at killing the ant's insect competitors than the fire ant itself.

And while some heavily persecuted species are beginning to develop resistance to the chemicals that have long been used against them, isolating and testing predators that can be introduced as biocontrols can take eight or more years, according to Cofrancesco. "You can't just look in a book and find the answers," says a Washington-area Park Service pest coordinator.

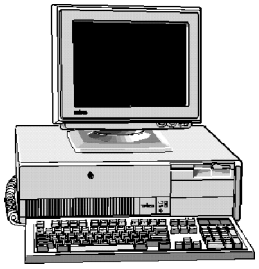
As one ranger observed, if there's any constant in his line of work, it's that the state of the art is always evolving. Not long ago, he noted, Hawaiian pest managers introduced the mongoose to prey on a troublesome rat population. It was only after the animals had been released into the wild that managers realized that the rats were nocturnal -- and, thus, would never be eaten by their diurnal predator. Now, the mongoose itself is a pest. "We can laugh at the mongoose story," he says, "but someday people will be laughing at what we do, too."

The Federal Interagency Committee for the Management of Noxious and Exotic Weeds can be accessed on the World Wide Web at:

http://bluegoose.arw.r9.fws.gov/ficmnewfiles/ficmnewhomepage.html

---- Government Executive, DEC 95, pp. 36-40.

TIB BYTES



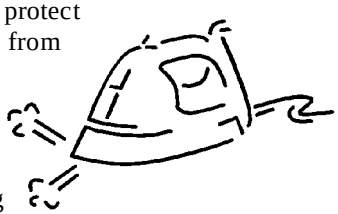
Mosquito Genomics Database (MsqDB) - A new mosquito database is now available on the World Wide Web (WWW):

http://klab.agsci.colostate.edu/

The purpose of this database is to collate both genetic and physical chromosome mapping data across mosquito species. Presently, MsqDB has 49,995 references, of which some 35,000+ come from the Mosquito Database University of Notre Dame (MODABUND) project. MODABUND was compiled by R.A. Hellenthal and T. J. Crovello in the early 1970s at the University of Notre Dame. Since then it has been in the care of S. Hanson and the late G. B. Craig, who provided it electronically for inclusion in MsqDB. Updated keywords have been assigned, along with a number of changes in the interface to MsqDB. ---- Dr. Dennis L. Knudson, Department of Entomology, College of Agricultural Sciences, Colorado State University, Fort Collins, CO 80523, Via e-mail: **dknudson@lamar.colostate.edu**

TIB BITS

Starch: A Renewable Treatment for Protection from Pesticides on Clothing - Ordinary laundry starch has been found to protect pesticide applicators from harmful chemicals. Starch binds with chemical pesticides and keeps them away from the skin until the clothing can be washed. Additionally, the starch-bound chemicals are easily washed from the clothing. Cotton or cotton-polyester garments that have been starched provide a durable finish that traps pesticides, prevents their transfer to the skin, and allows moisture vapor to be transported away from the skin.



Starch may assist in protecting applicators, but proper protective clothing should always be worn when applying pesticides, and clothing used during pesticide application should be washed separately from all other clothing. ---- ACCES--Pesticides, The University of Arizona, Pesticide Coordinator's Office, 21(1): 1-3 JAN 96.

Mixed Public Perceptions of Pesticides - Perceptions of pesticide risks, health effects, and economic impacts vary widely among the public, according to a study by

Dr. Eileen van Ravensway, a Michigan State University agricultural economics professor.

Risks from residues in food were perceived as great by one fourth of the public surveyed, while about the same percentage perceived little or no danger. The range of health effects perceived included not only cancer, but also allergic reactions and nervous system disorders. In addition, there was concern for adverse environmental effects and illness to agricultural workers. An important factor in risk perception was trust in the government to set and enforce safety standards, and trust in the agricultural industry to follow these. Unfortunately, neither group was highly trusted, and reestablishing this trust is considered necessary to reduce fears concerning pesticides.

Finally, most of the public believed that adequate pest control alternatives exist -- and about half believed that they are not costlier than pesticides to use. Because of this, many respondents questioned whether pesticides should be used at all. In addition, although most people were willing to pay five percent more for food with reduced pesticide levels, over one-third were unwilling to pay more for such food. ---- Public Perceptions of Agrichemicals, University of the District of Columbia Pesticides Coordinator Report, September 1995; via The University of Arizona Cooperative Extension Service: ACCES -- Pesticides, 20(11): 4, NOV 95.

PUBLICATIONS OF INTEREST

ALSC Accredited Agencies for Supervisory and Lot Inspection of Pressure Treated Wood Products - A listing of the current accredited agencies for supervisory and lot inspection of pressure treated wood products (MAR 96) issued by the American Lumber Standards Committee (ALSC) is available from DPMIAC. To receive a copy, please fill out the request form at the end of this TIB and return it to DPMIAC.

Freshwater Plants Poster - This 2' X 3' poster is printed in full-color and suitable for framing or wall mounting. The poster depicts 63 aquatic plants in a typical natural setting, and shows their common and scientific names. The poster costs $7.00 plus tax and shipping. Ask for Catalog No. SM-51 from IFAS Publications Office, University of Florida, P.O. Box 110011, Gainesville, FL 32611-0001, Tel: (352) 392-1764.

Citizen's Guide to Pest Control and Pest Safety Published by the EPA - The EPA has published a new 49-page brochure entitled "Citizen's Guide to Pest Control and Pest Safety," which covers pest management for a wide variety of common needs. The brochure addresses nonchemical control methods, pest prevention indoors and outdoors including gardens and lawns, choosing the right pesticide, reading the label, using pesticide products safely and correctly, pesticide poisoning and handling a poisoning emergency, pesticides and child safety, and choosing a pest control company. This publication can be obtained by contacting the National Center for Environmental Publications and Information, P.O. Box 42419, Cincinnati, OH 45242-2419. The guide is also available through the internet at EPA's gopher site: **gopher.epa.gov** or on the World Wide Web: **http://www.epa.gov** ---- ACCES--Pesticides, The University of Arizona, Pesticide Coordinator's Office, 21(1): 2, JAN 96.

Prevention and Control of Wildlife Damage - This publication from the University of Nebraska is available as a book or on CD-Rom. Copies are available for $40.00 each with $5.00 shipping for the book and $3.00 shipping for the CD. Copies of the book plus the CD-ROM are available at a discount price of $60.00 plus $5.00 shipping. Send orders (prepaid to the University of Nebraska) to Wildlife Damage Handbook, 202 Natural Resources Hall, University of Nebraska, P.O. Box 830819, Lincoln, NE 68583-0819, Tel: (402) 472-2188.

SELECTED MEETINGS

JUNE 16-21. VII International Congress on Lyme Borreliosis - San Francisco, CA. Mary Ellen Fernandez, P.O. Box 2087, Fort Collins, CO 80522, Tel: (970) 221-6426.

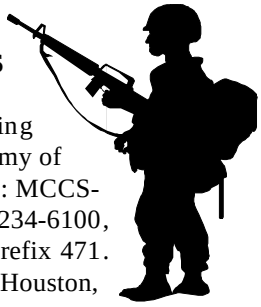
JULY 15-18. 152nd Meeting, Armed Forces Pest Management Board - Washington, DC. COL Don Driggers, AFPMB, Forest Glen Sect., WRAMC, Washington, DC 20307-5001, Tel: (301) 295-7476, Fax: (301) 295-7473, DSN Prefix 295, E-mail: **driggedp@acq.osd.mil**

OCTOBER 27-31. 63rd Annual National Pest Control Association Convention & Exposition - San Diego, CA. NPCA Meetings Department, 8100 Oak Street, Dunn Loring, VA 22027, Tel: (800) 678-6722 or (703) 573-8330.

DECEMBER 8-12. Entomological Society of America Annual Meeting - Louisville, KY. David J. Voegtlin, Tel: (217) 244-2152, Fax: (217) 333-4949, E-mail: **dvoegtli@uiuc.edu** Information is also available on the World Wide Web: **http://www.inhs.uiuc.edu**

COURSES FOR DoD PEST MANAGEMENT PERSONNEL

If you see any information that needs correcting or updating, please contact Capt(Sel) Forcum, who can be reached at Tel: (301) 295-7479, DSN Prefix 295 or e-mail: **forcumch@acq.osd.mil**



ARMY SPONSORED COURSES

1. For information on the following courses, contact SSG Sutton, Academy of Health Sciences, U.S. Army, ATTN: MCCS-HPM, Fort Sam Houston, TX 78234-6100, Tel: (210) 221-5270/4278, DSN Prefix 471. Classes are conducted at Fort Sam Houston, TX.

Pest Management Technology - Core Instruction for Initial Certification:
5-9 AUG 96

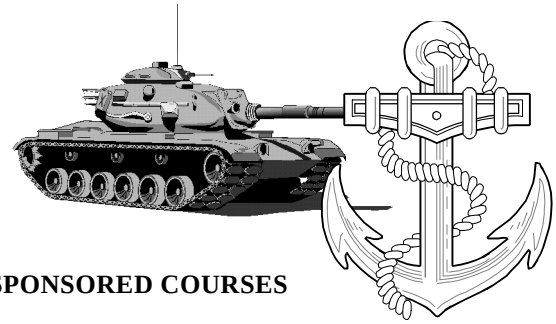
Plant Pest and Vegetation Management - Initial Certification for Categories 3, 5 & 6:
12-16 AUG 96

Arthropod and Vertebrate Pest Management - Initial Certification for Categories 7 & 8:
19-23 AUG 96

Recertification:
9-13 SEP 96

2. For information on courses in Germany, contact MAJ Tom Logan, HQ, USACHPPM-EUR, CMR 402, Box 137, APO AE 09180, Tel: 49-6371-86-8540/44, DSN: 486-8540/44. Classes are conducted at the USACHPPM-EUR, Landstuhl, Germany.

3. For Information on courses taught at the Environmental Training Center, contact Ms. Gail Boeff, ATTN: ATZR-BT, Fort Sill, OK 73503-5100, Tel: (405) 351-2111, Fax: (405) 351-5722, DSN Prefix 639. The Environmental Training Center at Fort Sill, OK conducts a variety of environmental, natural resources and occupational health courses.



NAVY SPONSORED COURSES

1. For information on the following courses, contact Mr. F. De Masi, NDVECC, Naval Air Station Jacksonville, Box 43, Jacksonville, FL 32212, Tel: (904) 772-2424, Fax: (904) 779-0107, DSN Prefix 942. Classes are conducted at the Disease Vector Ecology and Control Center, NAS Jacksonville, Jacksonville, FL.

Medical Entomology and Pest Management Technology (B-322-1050):
3-14 JUN 96
8-19 JUL 96

Pesticide Applicator Training (Core) (B-322-1070), Instruction for Initial Certification:
9-16 SEP 96

Plant Pest and Vegetation Management (B-322-1071), Initial Certification for Categories 2, 3, 5 & 6:
17-20 SEP 96

Arthropod and Vertebrate Pest Management (B-322-1072), Initial Certification for Categories 7 & 8:
23 SEP - 3 OCT 96

Recertification Course (B322-1074), Category 8:
19-21 NOV 96

Operational Entomology Training (B-322-1077), designed for A/D & Reserve PMTs, EHOs, Entomologists, Epidemiologists & others assigned to PM units:
21 OCT - 1 NOV 96

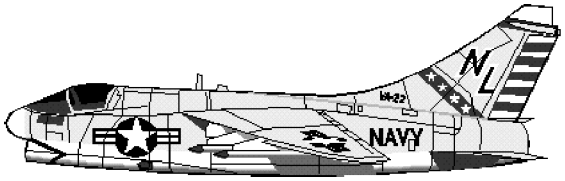
2. For information on the following courses, contact HMC Weens, NDVECC, Naval Air Station Alameda, Building 130, Alameda, CA 94501-5039, Tel: (510) 263-2806, DSN Prefix 993 or HM1 Leroy who can be reached at Tel: (360) 315-4452/54. Classes are conducted at the Disease Vector Ecology and Control Center, NAS Alameda, Alameda, CA.

Medical Entomology and Pest Management Technology for Preventive Medicine Technicians (B-322-0017):
22 JUL - 16 AUG 96

Medical Entomology and Pest Management Technology (Reserve Training) (B-322-1050):
9-20 SEP 96 at Bangor, WA

Recertification Course (B-322-1074), Category 8:
3-6 SEP 96 at Bangor, WA

Shipboard Pest Management (B-322-1075): NDVECC(A)
10 JUL 96 at Bangor, WA
21 AUG 96 at Bangor, WA
25 SEP 96 at Bangor, WA



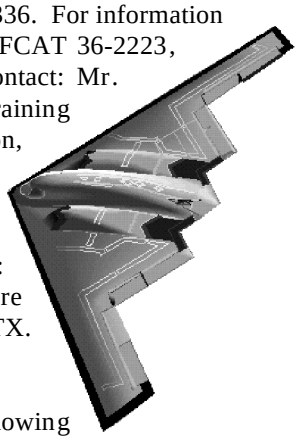
3. For more information on the following course, contact Mr. Mel Marks, SOUTHNAVFACENGCOM (Code 16AMM), Box 190010, North Charleston, SC 29419-9010, Tel: (803) 820-7019, DSN Prefix 583, Fax: (803) 820-7019, E-mail: **mpmarks@efdsouth.navfac.navy.mil**

Recertification Course
28 OCT - 1 NOV 96

The course will be held in the main conference room of the BOQ (Building 11) where a block of rooms will be reserved for student occupancy. Pest control applicator and contract personnel will be given a full range of category training during the complete four-day training session. MWR golf course personnel and others only desiring category 2, 3, 5 and 6 certification would attend the first two and one half days of the training.

AIR FORCE SPONSORED COURSES

1. For information on courses at Sheppard AFB, contact the Programs Division, 2AF/DOP, Keesler AFB, MS 39534-5000, DSN: 597-1336. For information on course content, refer to AFCAT 36-2223, USAF Formal Schools or contact: Mr. Dale Hess, 366 TS/TSIM (Training Squadron/Training Squadron, Instructional Mechanical), 727 Missile Road, Sheppard AFB, TX 76311-2254, DSN: 736-5790, DSN Fax: 736-3345. Classes are conducted at Sheppard AFB, TX.

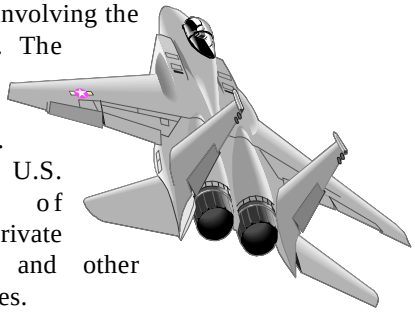


2. For information on the following course, contact Maj Will Rogers, USAF School of Aerospace Medicine/EH, Brooks AFB, TX 78235-5123, Tel: (210) 536-2058/59, DSN Prefix 240.

Operational Entomology Course (OEC) - #B30ZY43M3-000 is a two-week training course that includes vector bionomics and vector-borne disease profiles, surveillance and control of vectors and vector-borne diseases, and information, intelligence, and perspectives on developing country operations during exercises, hostilities, and natural disasters. Academic instruction, practical exercises and field experiences simulate actual vector-borne disease surveillance and control situations. The course is designed to provide training for the following Air Force specialties and DoD personnel: public health officers (43H1/3); public health apprentices (4E031, E-2 and above with completion of 5-level CDC and the recommendation of your supervisor), journeymen (4E051), craftsmen (4E071), or superintendents (4E091); medical entomologists (43M1/3); flight surgeons (48A1/3 or 48P1/3); pest management apprentices (3E433, E-2 and above with completion of 5-level CDC and the recommendation of your supervisor), journeymen (3E453), craftsmen (3E473), or superintendents (3E490 with a prior AFSC 3E433, 3E453, and 3E473), or equivalent civilian pest management personnel; and other military and civilian public health and pest management personnel with the consent of the faculty. Quotas are obtained through the Unit or MAJCOM Training Managers. Army and Navy personnel may contact USAFSAM/EH to request attendance in OEC and are admitted as slots become available.
8-19 JUL 96
9 -20 SEP 96

3. For information on the following course, contact Dr. Terry L. Biery, 757 AS/DOSE, YARS, Vienna, OH 44473-5000, Tel: (216) 392-1111/1178, DSN Prefix 346.

Aerial Application of Pesticides (Certification) - #AAP-001 is a one-week course that addresses the tenets and methodologies for aerial application of pesticides, with an emphasis on operational aspects and military applications. The course includes general principles, legal aspects, contracts, map types and preparation, spray system calibrations, aerial spray math, DoD spray systems, meteorological effects, occupational health and safety, operations and mission support, disease control, pilot's view, private applicator's view, environmental aspects, computer modeling, swath and droplet characterization, pesticide monitoring, public relations, contingency wartime usage, spill prevention and containment, and other pertinent operational issues involving the use of aerial spray. The course features guest lecturers from the U.S. Army, U.S. Navy, U.S. Department of Agriculture, private applicator firms, and other government agencies.
10-14 JUN 96



CIVILIAN SPONSORED COURSES

46th Annual Acarology Summer Program - Department of Entomology, The Ohio State University. Soil Acarines: June 17-July 5. Agricultural Acarines: June 24-July 5. Medical-Veterinary Acarines: June 24-July 5. For more information, contact Dr. Glen R. Needham, Summer Program Coordinator, Acarology Lab, The Ohio State University, 484 W. 12th Ave., Columbus, OH 43210-1292, Tel: (614) 292-7609, Fax: (614) 292-1538, E-mail: **gneedham.acs.ohiostate.edu**

Summer Institute in Tropical Medicine and Public Health - The John Hopkins School of Hygiene and Public Health is offering this eight week course from July 8-August 30. For more information contact Heather Roth, 615 N. Wolfe Street, Room 5521, Baltimore, MD 21205, Tel: (410) 614-3949, Fax: (410) 550-6733, E-mail: **hroth@phnet.sph.jhu.edu**

Pesticide Effects to Fish and Wildlife Resources - The U.S. Fish and Wildlife Service is offering this course, free of charge, to DoD employees. The course will be held May 20-24, at the University of Wisconsin, School of Veterinary Medicine, Madison, WI. For more information contact Sherry Crest, who can be reached at, Tel: (304) 725-8461, ext 267.

Environmental Investigations - The U.S. Fish and Wildlife Service is offering this course, free of charge, to DoD employees. The course will be held August 12-16, at the University of Nevada, Reno, NV. For more information contact Sherry Crest, who can be reached at, Tel: (304) 725-8461, ext 267.

Master and Apprentice Termite Technician School - Clemson University is offering two-day classes to both novice and more experienced termite technicians. For more information about the courses, contact Jackie Ellis, Cooperative Extension Service, USDA, Clemson University, Clemson, SC 29634-0310, Tel: (803) 656-3111.
14-15 AUG 96 (apprentice)
11-12 SEP 96 (master)
9-10 OCT 96 (apprentice)
13-14 NOV 96 (master)

FEDERAL REGISTER

The following is compiled from the Federal Register (FR), which is a daily listing of rules, proposed rules, and notices generated by U.S. Government agencies. Executive Orders, proclamations, and other documents from the President are also in the FR. Our listings include FR items which may be of interest to the DoD pest management and natural resources communities; environmental impact statement listings and other DoD items unrelated to pest and natural resource management generally are not included.

VOL 61 No. 22-41 (1-29 February 1996)

6-4394 Fish and Wildlife Service, Interior (FWS) - Action - Proposed Rule; Reopening of the Comment Period - Endangered and Threatened Wildlife and Plants; Reopening of Comment Period for Proposed Establishment of a Nonessential Experimental Population of California Condors in Northern Arizona.

6-4394-96 FWS - Action - Proposed Rule; - ETWP; Proposal to Designate the Whooping Cranes of the Rocky Mountains as Experimental Nonessential and to Remove Whooping Crane Critical Habitat Designations from Four Locations.

6-4401-06 FWS - Action - Proposed Rule; Withdrawal - ETWP; Withdrawal of the Proposed Rule to List the Fish Virgin Spinedace as Threatened and Withdrawal of the Proposed Rule to Designate Critical Habitat for the Virgin Spinedace.

7-4710-13 FWS, National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA) - Action - Draft Policy; Request for Public Comments - Draft Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act; Request for Public Comment.

7-4716-20 FWS, NMFS, NOAA - Action - Draft Policy; Request for Public Comments - Draft Policy Regarding Controlled Propagation of Species Listed Under the Endangered Species Act; Request for Public Comment.

7-4722-25 FWS, NMFS, NOAA - Action - Notice of Policy - Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act.

9-5025 FWS - Action - Notice of Document Availability - Notice of Availability of Draft Recovery Plan for the Delhi Sand Flower-Loving Fly for Review and Comment.

14-5769-70 Environmental Protection Agency (EPA)

- Action - Notice - Certain Companies; Applications to Register Pesticide Products.

14-5770-71 EPA - Action - Notice - S. C. Johnson and Son, Inc.; Application to Register a Pesticide Product.

15-5971-72 FWS - Action - Notice of 90-Day Petition Finding - ETWP; 90-Day Finding for a Petition to De-List the Maryland Darter (*Etheostoma sellare*).

23-6964-65 FWS - Action - Notice of Availability of the Draft Environmental Alternatives Analysis for the Proposed Special Rule for the Conservation of the Northern Spotted Owl on Non-Federal Lands and Extension of Public Comment Period on the Proposed Special Rule - ETWP; Proposed Special Rule for the Conservation of the Northern Spotted Owl on Non-Federal Lands**.**

28-7508-09 EPA - Action - Notice - Propoxur; Decision Not to Initiate a Special Review.

28-7509-12 EPA - Action -Notice of Receipt of Requests for Amendments to Delete Uses in Certain Pesticide Registrations.

29-7271-72 FWS - Action - Notice of Document Availability - Availability of a Draft Recovery Plan for the Rare Species of Soldier Meadows for Review and Comment.

VOL 61 No. 42(1-31 March 1996)

1-8014-16 FWS - Action - Notice of 12-Month Petition Finding - ETWP; 12-Month Finding for a Petition to List the Ohlone Tiger Beetle as Endangered.

1-8016-18 FWS - Action - Notice of 90-Day Petition Finding - ETWP; 90-Day Finding for a Petition to List the Fisher in the Western United States as Threatened.

1-8018-19 FWS - Action - Notice of 12-Month Petition Finding - ETWP; 12-Month Finding for a Petition to List the Amargosa Toad (*Bufo nelsoni*) as Endangered.

1-8186-203 EPA - Action - Notice of Preliminary Determination to Terminate Special Review; Announcement of Receipt of Voluntary Cancellation - Cyanazine; Notice of Preliminary Determination to Terminate Special Review; Notice of Receipt of Requests for Voluntary Cancellation.

4-8205 Animal and Plant Health Inspection Service, USDA (APHIS) - Action - Affirmation of Interim Rules as Final Rule - Mediterranean Fruit Fly.

4-8279-82 EPA - Action - Notice of Availability - Testing Guidelines; Notice of Availability.

4-8282-83 EPA - Action - Notice of Availability and Request for Comments - Revision of Prenatal Developmental Toxicity Study and Reproduction and Fertility Effects Testing Guidelines Under FIFRA and TSCA; Notice of Availability and Request for Comments.

6-8876-79 EPA - Action - Final Rule - Exemption of Certain Pesticide Substances from Federal Insecticide, Fungicide, and Rodenticide Act Requirements.

6-8928-30 EPA - Action - Notice - Notice of Receipt of Requests for Amendments to Delete Uses in Certain Pesticide Registrations.

6-8930-32 EPA - Action - Notice - Notice of Receipt of Requests to Voluntarily Cancel Certain Pesticide Registrations.

8-9454-55 EPA - Action - Notice - Notice of Receipt of Requests to Voluntarily Cancel Certain Pesticide Registrations.

8-9456-57 EPA - Action - Notice - Notice of Receipt of Requests for Amendments to Delete Uses in Certain Pesticide Registrations.

15-10693-97 FWS - Action - Final Rule - ETWP; Reclassification of *Mirabilis macfarlane*i (MacFarlane's Four-O'clock) from Endangered to Threatened Status.

19-11180-81 FWS - Action - Request for Comments - Proposed Consolidation of Lists of Wildlife and Plants.

20-11411-13 EPA - Action - Notice - Notice of Receipt of Requests to Voluntarily Cancel Certain Pesticide Registrations.

22-11805-06 FWS - Action - Notice of Intent and Request for Comments - Migratory Bird Hunting: Regulations Regarding the Prohibition Against Artificially Altering or Manipulating Natural Vegetation in Moist Soil Areas to Attract Waterfowl for Hunting Purposes.

25-12084 FWS - Action - Notice of Document Availability and Public Comment Period - Availability of Draft Recovery Plan.

ARMED FORCES PEST MANAGEMENT BOARD
PROFESSIONAL PEST MANAGEMENT PERSONNEL
CERTIFICATION/RECERTIFICATION INFORMATION SHEET

COMPLETE ALL ENTRIES:

1. NAME_____ _____ - ____ -_____
LAST, FIRST, MI SSN (at least last 4 numbers)

2. MILITARY/CIVILIAN GRADE_____DEGREE/Education Level & Specialty_____

3. ADDRESS FOR CURRENT DUTY ASSIGNMENT:

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_____
_____ZIP_____-_____
COMM TEL # (_____)_____-_____, DSN # _____-_____ FAX # (_____)_____-_____

4. I REQUEST:

A. □ INITIAL CERTIFICATION (REQUIRED IF PRESENT CERT. EXPIRED > 6 MONTHS.)
□ CORE

B. □ RECERTIFICATION

- **□ 1a. AGRICULTURAL - PLANT**
- **□ 1b. AGRICULTURAL - ANIMAL**
- **□ 2. FOREST**
- **□ 3. ORNAMENTAL AND TURF**
- **□ 4. SEED TREATMENT**
- **□ 5. AQUATIC**
- **□ 6. RIGHT-OF-WAY**
- **□ 7. INDUSTRIAL, INSTITUTIONAL, STRUCTURAL, AND HEALTH RELATED**
- **□ 8. PUBLIC HEALTH**
- **□ 9. REGULATORY**
- **□ 10. DEMONSTRATION AND RESEARCH**
- **□ 11. AERIAL APPLICATION (INITIAL CERTIFICATION IN RESIDENCE)**

5. PRESENT CERTIFICATION #(S)_____, _____, _____
PAST #(S)_____, _____, _____

6. I REQUEST STUDY MATERIAL BE SENT TO ME AT ABOVE ADDRESS (IN NO.3) PRIOR TO THE EXAMINATION: □YES □ NO

7. TITLE AND ADDRESS OF COMMAND TRAINING OFFICER WHERE EXAM SHOULD BE SENT:

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8. TITLE AND ADDRESS OF OFFICIAL/COMMANDING OFFICER WHERE CERTIFICATE SHOULD BE FORWARDED FOR FINAL SIGNATURE BEFORE AWARDING:

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9. REQUESTORS SIGNATURE: _____ (APR 96)

Return to COL Driggers, AFPMB Forest Glen Section, WRAMC, Washington, DC 20307-5001.
Fax: (301) 295-7473 DSN Prefix 295.

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❑ Put me on the Technical Information Bulletin Mailing List. This periodical provides current information on pest management, pesticides, equipment, medical entomology, natural resources, laws and regulations, meetings and DoD courses.

Please send me the following Publications:

Technical Information Memoranda (TIM)

❑ NO. 5, Land Snails - Jun 1990
❑ NO. 11, Hydrogen Phosphide Fumigation with Aluminum Phosphide - Feb 1987
❑ NO. 13, Ultra Low Volume Dispersal of Insecticides by Ground Equipment - Mar 1985
❑ NO. 14, Personal Protective Equipment for Pest Management Personnel - Mar 1992
❑ NO. 15, Pesticide Spill Prevention & Management - Jun 1992
❑ NO. 16, Pesticide Fires: Prevention, Control & Cleanup - Jun 1981
❑ NO. 17, Pest Control Facilities - Replaced by MIL HDBK 1028/8A, - Nov 91
❑ NO. 18, Installation Pest Management Program Guide - Feb 1987
❑ NO. 20, Pest Management in Health Current Care Facilities - Oct 1989
❑ NO. 21, Pesticide Disposal Guide for Pest Control Shops - Oct 1986
❑ NO. 22, Guidelines for Testing Experimental Pesticides on DoD Property - Nov 1983
❑ NO. 23, Schistosomiasis - Jan 1987
❑ NO. 25, Devices for Electrocution of Flying Insects - Feb 1996
❑ NO. 26, Lyme Disease - Vector Surveillance and Control - Mar 1990
❑ NO. 27, Stored Products Pest Monitoring Techniques - Jun 1992
❑ NO. 29, IPM In and Around Buildings - Jul 94
❑ NO. 31, Contingency Retrograde Washdowns: Cleaning and Inspection Procedures - Dec 93
❑ NO. 34, Bee Resource Manual With Emphasis on the Africanized Honey Bee - Aug 95
❑ NO. 35, Termite Inspection Recommendations -Feb 96
❑ NO. 37, Guidelines for Reducing Feral/Stray Cat Populations on Military Installations in the United States - Jan 96

Other Publications

❑ Pesticide Environmental Stewardship Program MOU
❑ ALSC Accredited Agencies for Supervisory and Lot Inspection of Pressure Treated Wood Products

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❑State Agency ❑Other

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